

NATIONAL ADVISORY COMMITTEE

FOR AERONAUTICS

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TECHNICAL NOTES

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No. 287

A DANGEROUS SEAPLANE LANDING CONDITION

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By Thomas Carroll.

Summary

A peculiar phenomena in seaplane landing is observed and reported. The seaplane having executed a normal fast landing at low incidence a forward movement of the control stick effected an unusual condition in that the seaplane left the water suddenly in an abnormal attitude. The observations describing this phenomena are offered as a warning against possible accident and as a conjectural cause of seaplane landing accidents of a certain kind.

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During the investigation of the pressure distribution on the bottom of the pontoon of a seaplane, the Vought UO-1 with Wright "Whirlwind" engine which comprised an exhaustive routine of landing, take-off, taxiing, etc., conditions, a very peculiar phenomena was observed with abnormal consequences. It was evolved in the following manner. On fairly smooth water and directly into a moderate wind, the seaplane was landed at low incidence, fairly fast, with part power on. Some discussion among the personnel handling the tests as to the condition which would produce the

maximum positive pressures on the forward part of the pontoon indicated that this might be attained by pushing forward on the stick during this condition of landing. Consequently, during the landing of this character under the conditions above stated the control stick was pushed rather suddenly forward a distance of about 6 inches. With considerable abruptness the seaplane appeared to rock forward onto the "toe" of the pontoon and then leave the water, "bouncing" to a height estimated by observers from the beach of about 10 feet. During this "bounce" there was no tendency for the nose to rise as in the more usual "porpoising" condition, the feeling being that the airplane was travelling at a small negative angle of attack. At the top of the "bounce" there was a tendency to nose over, which was counteracted with some difficulty by the elevators; and a rather poor pancake landing with the tail only moderately well down was then made, the engine failing to pick up when throttle was applied.

A number of attempts were made to duplicate the conditions as in the first effort, with consequences generally similar but of varying intensity and slightly modified behavior. It is evident that such procedure applied by a pilot of small experience on seaplanes might produce unpleasant results, and it is suggested that landing accidents can be recalled where these conditions may have obtained which have resulted in the seaplane nosing in after the initial "bounce" with considerable injury

to the airplane and its occupants.

It is thought that in some types of seaplanes where the controls are statically heavy and particularly in types with wheel control that the landing having been made in the so-called "hot" condition and while the seaplane is running along with exceptional smoothness although somewhat fast, the impression conveyed to the pilot is one of a completed landing. In such a case should the pilot release his hold on the controls it might easily occur that the static weight would be sufficient to effect the dropping of the elevators to an angle which would produce this phenomena and should the pilot have turned his attention and his hands to the adjustment of goggles or other gear, that he might not regain control sufficiently to overcome "nosing in."

From the pressure distribution records which were obtained on one such case it is interesting to note that the positive, upward, pressure on the bottom of the pontoon was very high compared with other conditions of water maneuvers which, coupled with an upward aerodynamic load on the tail plane provides the impetus for the "bounce" which ensues.

#### Conclusion

It is concluded that to avoid the dangerous consequences of allowing this condition to develop that careful maintenance of control throughout the landing is essential.

Langley Field, Va., February, 1928.